



**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q78819

Honchin EN, et al.

Appln. No.: 10/751,428

Group Art Unit: 3729

Confirmation No.: 3200

Examiner: Minh N. TRINH

Filed: January 6, 2004

For: PRINTED WIRING BOARD AND ITS MANUFACTURING METHOD

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

**MAIL STOP AF - PATENTS**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Pursuant to the Pre-Appeal Brief Conference Pilot Program, and further to the Examiner's Final Office Action dated April 2, 2009 and the Advisory Action dated June 17, 2009, Applicant files this Pre-Appeal Brief Request for Review. This Request is also accompanied by the filing of a Notice of Appeal.

***Response To The Examiner's § 103 Rejection Based on Ellis***

Issue 1 is whether the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ellis (GB 2214250) is proper.

Appellant respectfully submits that the presently claimed invention is not anticipated by or rendered obvious by Ellis because, considering the teachings of Ellis, a person having ordinary skill in the art would not have a reason to arrive at the presently claimed invention, nor would such a person have expected that the presently claimed invention would produce plated metal films having a higher degree of crystallinity. In addition, the rejection as set forth in the

Office Action was facially deficient for failing to address the voltage time/interruption time characteristics of the present claims, which makes the filing of this Request particularly appropriate. The Pre-Appeal Brief Request for Review was “designed to allow applicants who think there is a clear deficiency in the *prima facie* case in support of a rejection to file the request at the same time that they file a notice of appeal.” (*See* USPTO, *New Pre-Appeal Brief Pilot Program*, <http://www.uspto.gov/go/og/2005/week28/patbref.htm> (emphasis added).)

Claim 1 presently recites an electroplating process of electroplating an electrically conductive substrate comprising electroplating intermittently (to a predetermined plating thickness) using the substrate surface as a cathode and a plating metal as an anode at a constant voltage between the anode and the cathode by repeating application of a voltage between a cathode and an anode and interruption of the application alternately.<sup>1</sup> The voltage time/interruption time ratio is 0.1 to 1.0, the voltage time is not longer than 10 seconds, and the interruption time is not less than  $1 \times 10^{-12}$  seconds.

The recited voltage time/interruption time ratio of 0.1 to 1.0 means that the interruption time is equal to or longer than the voltage time. The voltage interruption permits the metal ions around the interface of the substrate to diffuse, which in turn maintains a constant concentration of metal ions at all times. This means that no defect will occur in the crystal lattice of the

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<sup>1</sup> The recitation in parentheses was added in the Amendment filed June 11, 2009, which was not entered by the Examiner. (*See* Advisory Action dated June 17, 2009.) However, the remarks herein do not rely on this recitation, and in addition, Appellant addresses herein below the Examiner’s incorrect position for not entering this claim amendment.

precipitated metal layer, and thus a higher degree of crystallinity is obtained. The intermittent voltage application permits the formation of an electrodeposition having a highly uniform thickness in the marginal or central area of, for example, the substrate board surface. The presently claimed invention aims to further improve the crystallinity of the plated metal film by defining the interruption time to be as long or longer than the voltage time.

Appellant respectfully submits that Ellis does not render the presently claimed invention obvious because Ellis discloses its conditions of independent-variable reversed voltage as follows: forward at 2 amps for 10 msec. and reverse at 7 amps for 0.5 msec. (see Example 1 of Ellis); and forward at 3 amps for 10 msec. and reverse at 5 amps for 1 msec. (see Example 2 of Ellis). In other words, Ellis discloses a relationship between the voltage time and the interruption time that is the reverse of the presently claimed invention. Following the disclosure in Ellis, a person having ordinary skill in the art would not have a reason to arrive at the presently claimed invention, nor would they have expected that the presently claimed invention would produce plated metal films having a higher degree of crystallinity.

Appellant also respectfully submits that the rejection based on Ellis was improper and did not establish a proper *prima facie* case of obviousness because it did not point to any disclosure in any cited reference of (1) a voltage time/interruption time ratio of 0.1 to 1.0; (2) a voltage time of not longer than 10 seconds; and (3) an interruption time of not less than  $1 \times 10^{-12}$  seconds. Without addressing these elements, there is a clear deficiency in the asserted *prima facie* case in support of the rejection; thus, this improper rejection should be withdrawn.

With respect to the position in the Office Action that the presently recited voltage time/interruption time characteristics are “design choices,” Appellant respectfully submits that

this is incorrect, and that this is not the proper basis for a §103 rejection. First, Appellant notes that the Office Action has not carried its burden - nowhere in the Office Action is there any support for this position. As a result, this is another example of how this rejection does not establish a *prima facie* case of obviousness against the claims. Second, the Office Action has not set forth a reason why a person having ordinary skill in the art would alter the teachings in Ellis to arrive at the presently claimed invention. Absent that rationale, it is improper to disregard a required claim element as merely a “design choice.” Again, the Office Action has not carried its required burden to show a *prima facie* case of obviousness.

Appellant therefore respectfully submits that the presently claimed invention is not anticipated by or rendered obvious by Ellis, and respectfully requests the reconsideration and withdrawal of this § 103 rejection.

***Response To The Examiner’s § 112 Rejection***

Issue 2 is whether the Examiner improperly refused entry of the claim amendment filed June 11, 2009, and further to this amendment, whether the rejection of claim 1 under 35 U.S.C. § 112, second paragraph, should be maintained.

In the Advisory Action, the Examiner indicated that the claim amendment discussed above was not entered because it raised an issue that requires further search. Appellant respectfully disagrees. The claim amendment only address the § 112 issue and did not require any additional searching on the part of the Examiner. Accordingly, Appellant respectfully submits that the claim amendment should have been entered.

In this regard, to advance the prosecution and render the rejection moot, Appellant amended claim 1 to recite that the electroplating process is performed to a predetermined plating

thickness. Amended claim 1 provides an electroplating process which, by utilizing a constant-voltage pulse process, is capable of providing an electroplated metal layer having good crystallinity and uniform deposition on a substrate surface, with low equipment cost. A person having ordinary skill in the art would understand that the end point of the electroplating process is the point in time where the electroplated metal film has grown to a targeted thickness.

Further, even without entry, in view of the reason above, Appellant respectfully submits that claim 1 as previously written was clear and definite (i.e., claim 1 prior to the Amendment filed June 11, 2009).

Finally, should this rejection be maintained, Appellant respectfully requests that the Examiner specifically and clearly point out how the claim is indefinite.

For at least these reasons, reconsideration and withdrawal of this rejection is requested.

### ***Conclusion***

It is respectfully submitted that the claims on appeal are clear, definite and patentable over Ellis, and therefore, Appellant respectfully submits that withdrawal of the final rejection upon review by the Pre-Appeal Panel is proper.

Respectfully submitted,

/Michael G. Raucci (61,444)/ for

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**23373**

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